

THE TRANSIT OF VENUS.

LE GENTIL'S OBSERVATION IN THE LAST CENTURY.

From Nature.

As all the world is now thinking of the transit of Venus, an episode of old time in connection therewith should be very interesting.

In a series of articles by M. W. De Fonvielle in *La Nature*, some interesting facts are given concerning Le Gentil's observations of the transit of Venus in the open sea about the middle of last century. These we reproduce here with some supplementary information from Le Gentil's own interesting work referred to below. His voyages extended altogether from 1760 to 1771. They consequently commenced before the transit of 1761, and were continued after that of 1769.

The expeditions of Le Gentil, the account of which, published by the royal press, fills two magnificent volumes, have left an ineffaceable mark upon the history of astronomy. His work is a proof that a man of energy and perseverance who sets himself to the solution of a great and beautiful problem can find, in spite of all obstacles, the means of immortalizing himself. Posterity certainly owes some indemnification to the indefatigable astronomer, since his determination to solve scientific questions was undoubtedly prejudicial to his interests, and even to his love affairs.

A pupil of De l'Isle, Le Gentil was intended for the church by his family, whose home was at Coutances, where he was born Sept. 12, 1725; but his attachment to Mlle. Potier, belonging to one of the richest families of Cotentin, made him give up all idea of so very celestial a profession. A happy marriage, contracted in 1771, after eleven years of absence, enabled him to triumph over his enemies, who had taken advantage of his being far away to fill up his place in the Academy of Science, and against his relations, who had attempted to take possession of his property; he had to go to law to make them give up what they had taken. His death, which had been announced so often, was very nearly becoming a reality, for he was seized by a dangerous malady, which would have carried him off but for the affectionate care of his wife.

The Duc De La Vrillière, Minister of State, intrusted with the distribution of *lettres de cachet*, was then Director of the Academy. Le Gentil, having received from his bureau the orders of the King, embarked in 1760 for the Isle of France on board the *Berrver*, a vessel of the Indian Company, which carried fifty guns, and sailed in company of the Comte D'Artois of sixty-four. On July 10 he arrived at the Isle of France. Le Gentil resolved to proceed to Rodriguez, where he did not know that Canon Pingré, who had left Paris after him, had arrived, to execute a mission which he had received from the Academy. The two astronomers would have unexpectedly met on that island, then almost a desert, if Le Gentil had not found at the Isle of France the *Sylphide*, a frigate sent to the help of Pondicherry, Le Gentil's original destination. He, full of ardor, did not hesitate to embark on board of this vessel. But the winds were adverse to the expedition, and the *Sylphide* wandered from March 25, 1761, to May 24, the sport of calms and of the irregular winds of the north-east monsoon. On May 24, when off the coast of Malabar, Le Gentil learned that Pondicherry had been taken by the English. It was then necessary to return to the Isle of France, where the *Sylphide* arrived only on June 23, after having touched at Point de Galle on May 30.

It was between these two stations that Le Gentil observed the transit of Venus, of which the following is his description, stripped of all extraneous details:

"To observe the entry of Venus I employed an excellent objective of fifteen feet (French) focus, fixed to a tube composed of four nine planks, which I had made sufficiently solid without being too heavy. To work it I got a small mast, with a hal-liard fitted on the port quarter-deck. I saw that it was useless to attempt to notice the first moment of the entry of Venus, for I did not want to fatigue myself and run the risk of not being able to observe the total immersion. Indeed, I had sufficient trouble to fix the sun, on account of the movement of the ship.

When Venus had half entered, or nearly so, on the disk of the sun, which I recognized by my reflecting quadrant, I attached myself, so to speak, to the telescope of fifteen feet to try to catch the moment of total entry. As my watch was none of the best, and as I could not take the height of the sun precisely at the moment when Venus appeared to be totally immersed, it occurred to me to make use of the sand-glass, by means of which the way of the vessel was measured, and I had by my side a man well up to turning the glass at the instant in such a way that it was impossible to have an error of more than a quarter of a second each time.

The weather having become overcast, and the rain having shown itself, I did not think it would be possible to notice the exit of Venus. Consequently I did not cause the mast to be changed, as I ought to have done, for we had tacked since 11:30.

At 2 o'clock it cleared a little, and shortly after weather cleared so that I could see Venus very distinctly with my green objective, and without the help of any other colored glass, and I was not incommoded. I saw, from this observation, that it was not impossible for a person used to the movement of a vessel, and accustomed to the use of large instruments, to observe, especially when the sea is calm, the immersions of the satellites of Jupiter with a telescope of twelve or fifteen feet, which would have a large field, and to determine the time of those immersions in the above manner, for I believe myself safe in asserting that I did not make from them from fifteen to twenty seconds in time of error on an immersion of the first satellite of Jupiter."

The observations made under these extraordinary circumstances, give for the total immersion of Venus, 8h. 27m. 56¹/₂s., the commencement of the exit, 2h. 22m. 53s.; the total exit, 2h. 38m. 52¹/₂s., which gives for the duration, 6h. 10m. 55³/₄s., and for the time taken by the diameter to cross the limb of the sun, 15m. 59s. As M. De Seligny had observed at the Isle of France the exit of Venus, Le Gentil formed, for the meridian of his observation, 88° 20' 15". The log-book gave 87° 14' 0".

As there was to be another transit of Venus on June 3, 1769, Le Gentil resolved to spend eight years in the southern hemisphere to wait for it. He had the devotion to carry this resolution into effect, spending his time in making a series of curious and interesting observations in the Marcarene Islands, Madagascar Marianne Islands, the Philippines, and the coasts of India. He had fixed on Manilla as his place of observation, and reached it about August, 1766, but he was ordered to return to Pondicherry. By what must seem a cruel fatality, this patient devotee of science, when the day of the transit arrived, found his view of the sun completely shut out by clouds during the whole phenomenon, although for many days previous the sky had been cloudless. On the other hand, two friends whom he had left at Manilla were fortunate enough to witness the transit without obstruction. Le Gentil died on Oct. 22, 1792.